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ABSTRACT

What role should the federal government play in support of graduate education? Based on the principles that: (1) American graduate education and research establishment is a national resource; (2) the market for highly trained manpower is national; (3) the federal government itself employs the service of many highly trained personnel; (4) it is in the national interest for the federal government to stimulate response to changing manpower and knowledge needs; (5) the federal government can encourage students to enter less lucrative careers that are in the national interest; (6) governemnt decisions have a far-reaching impact on both the supply and/or demand for knowledge and manpower; (7) knowledge is part of the public domain; (8) the federal government can best redress social disadvantages resulting from disparities of race, income, ethnic origin, or sex, it follows that the federal government has two primary responsibilities with respect to graduate education: (1) to assure availability of sufficient manpower and knowledge to meet specific areas of national need; and (2) to assure that an optimum pool of qualified talent exists in all areas of knowledge essential to the long-term cultural and practical requirements of the nation. Federal policy must recognize the necessity of providing a consistent and reliable level of support so that universities will be able to plan and effectively administer their programs. (Author/KE)

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Federal Policy

and

Graduate Education

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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June 1975

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Table of Contents

	Page
Foreword	v
Background	1
The Goals of Federal Support	2
Characteristics of Federal Support	3
Changing Priorities of Federal Support	5
Basic Principles for Federal Support	10
Toward a Federal Policy for Graduate Education - Recommendations for Action	13

FOREWORD

For more than two decades Federal government programs and activities have played a major role in shaping graduate education in the universities of this nation. Recent shifts in national priorities and cutbacks in Federal support have caused considerable concern among those responsible for maintaining quality graduate education programs.

To assess these recent trends from the perspective of concerned Federal agencies, the Subcommittee on Graduate Education of the Federal Interagency Committee on Education (FICE) has prepared this report, which also contains recommendations for the future role of the Federal government in support of graduate education.

This report was prepared by Robert Snyder of the FICE staff, working under the general direction of Bernard Michael, Executive Director of FICE, and the Subcommittee, chaired by Dr. Frank D. Hansing, National Aeronautics and Space Administration. Barbara Montgomery of the FICE staff provided editorial assistance, and Mary Cox typed the manuscript.

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FEDERAL POLICY AND GRADUATE EDUCATION

Background

During the last 20 years, graduate education in the United States has undergone radical changes in size, structure, and goals. With the challenge of Sputnik in 1957 came a sharply increased demand for highly trained individuals, particularly scientists and engineers, to meet national manpower needs in such areas as defense and space. Congress enacted legislation providing more fellowships, traineeships, and training grants to support graduate students. Federal funds for research and development increased and, by the mid-60's, Federal aid was available for graduate facilities. By responding to a national crisis, the Federal government contributed substantially to the expansion of graduate education.

In the late sixties and early seventies, national priorities began to shift to new problems--energy and environment, for example. At the same time, there suddenly appeared to be an oversupply of individuals who were highly trained in areas no longer in demand. The graduate enrollment growth rate dropped. Federal support for graduate level training was severely reduced, making it difficult for institutions to carry out their programs.

These events have raised considerable concern as to how this Nation can best maintain its capability to produce knowledge and highly trained manpower, as required by changing events and national priorities. Graduate education represents the major vehicle for providing the people and the knowledge needed to respond to such

changes. This report, then, focuses on the question, "What role should the Federal government play in support of graduate education?" To arrive at recommendations for a Federal position, the Chairperson of FICE charged the Subcommittee on Graduate Education with examining the goals, characteristics, and changing priorities of Federal support. The Subcommittee also outlined some basic principles for Federal support of graduate education and prepared recommendations for Federal action.

The Goals of Federal Support

Over the last several decades, the Federal government has looked with increasing frequency to the Nation's universities for the practical knowledge and manpower needed to help solve pressing societal problems. At the same time, however, Federal interest has extended beyond immediate crises to the longer-term concern for development of highly trained individuals in a wide variety of academic and professional areas to ensure that the intellectual resources for as-yet-unforeseen crises will be ready when needed. The broad training and research support provided in the basic sciences by Federal agencies is indicative of this broader concern.

Another Federal goal, only recently articulated, is to preserve and encourage appreciation of the fine arts and cultural traditions. Support in this area began in 1958 with enactment of the National Defense Education Act (NDEA), which was a Congressional response to the launching of Sputnik. Title IV of NDEA provided broad-based graduate student fellowships which benefited the humanities as well as the natural and social sciences. Although Title IV has terminated,

increased funding of the National Endowments for the Arts and Humanities has firmly committed the Federal government to nurturing the Nation's artistic and cultural resources.

Still another goal, to which there is Federal commitment, is to ensure access to graduate and professional education by disadvantaged groups in the population. Graduate and professional education often leads to well-paid jobs and increased social and occupational mobility in our society. It is especially important, therefore, that groups heretofore excluded because of race, ethnic origin, sex, or income be assured access to graduate and professional education.

To summarize, then, the goals for Federal support of graduate education have been: (1) to solve current urgent problems of society, (2) to develop research competence in many broad areas, (3) to train skilled manpower for existing and emerging needs, (4) to preserve and advance cultural traditions, and (5) to ensure broad access to graduate education.

Characteristics of Federal Support

Traditionally, Federal support for graduate education and research has been through specific projects, both short-term and long-term, that were deemed to be in the national interest. Student as well as research support has been provided by mission-oriented agencies. Exceptions to the project grant system are the NDEA Title IV fellowships and National Science Foundation traineeships

and fellowships which have been distributed over a broad array of fields as well as institutions, and, in research, the limited unrestricted formula grants of the National Institutes of Health and NSF.

Institutional support for universities or graduate programs has customarily been provided by States to public institutions and by private sources (tuition, endowment, and gifts) to private institutions. The Federal government has had limited responsibility for such institutional support; however, continuous heavy Federal funding to selected departments within institutions has amounted to a de facto commitment to these departments, and by extension, to these institutions.

Estimates indicate that for 1967-68, 27 percent of the net current income of all private and public colleges and universities came from Federal funds, including those for organized research, compared to only 10 percent without organized research.[1] This dependence is even higher for private universities (32 percent in 1967-68). Furthermore, the trend in both public and private institutions has been toward greater Federal dependence over the years. NSF data (unpublished) indicate that the Federal portion of separately budgeted university research and development (i.e., excluding departmental research) increased from 54 percent in 1953 to 73 percent in 1968. While the Federal share has dropped somewhat since 1968 (70 percent in 1973), the university share of R&D work has remained at about 11 percent. Thus the bulk of Federal

support goes toward organized research, a predominantly graduate level activity.

The ability of the States to assume a larger share of the support for graduate education is highly doubtful. An Education Commission of the States (ECS) report indicates that State appropriations to "public advanced graduate and research universities" have dropped steadily since 1963 as a percentage of total State appropriations for public institutions of higher education.[2] States are increasingly devoting their resources to other areas of State responsibility, such as law enforcement and environmental protection. The cumulative effect of these trends seems to be a growing dependence of graduate institutions on Federal support.

Changing Priorities of Federal Support

Changing times have brought changing emphases and priorities for Federal support. The common thread of Federal policy in the last 25 years has been manpower production and research. The size and composition of those manpower and research needs, however, have changed considerably in recent years.

Wartime exigencies and the Sputnik scare determined the wide-ranging manpower orientation of Federal policy in the late 1950's and early 1960's. While scientific and technological manpower shortages were the most serious, the Nation began to perceive that deficiences existed in all educational areas. Universities, with Federal help, geared themselves to produce the highly trained

individuals needed to teach expanding undergraduate enrollments, train future scientists and engineers, and perform research for present and future needs. Much research was also funded at universities by mission agencies.

By the late 1960's and early 1970's the need for this broad-based support had changed. While college and university enrollments had risen at an average annual rate of 7 percent during the 1960's, creating the rapid increase in academic labor market demand, the growth rate slowed in the 1970's. Doctoral candidates already in the pipeline, however, continued to emerge at 1960's rates. The result was that the large annual increases in academic manpower overtook the demand generated by an undergraduate population whose growth rate was winding down. By 1970, massive Federal support had eradicated some manpower shortages, such as the one in college teaching, but others--in health and mental health clinical and research fields, for example--remained. The total number of scientists and engineers employed in academic institutions has also been declining since 1969. Similar trends in employment have occurred in industry and government.[3]

The Federal role in these trends may be seen as both initiating and responding to changes that led to the downturn in demand. The key is the magnitude of Federal R&D funding and its impact on manpower and training.

As noted earlier, the Federal share of expenditures for separately budgeted university R&D peaked at 73 percent in 1968 and fell

to 70 percent in 1970. Equally significant is the fact that similar support of industry R&D fell from 49 to 43 percent during the same period.[4] In addition, the Federal government continually performs intramural R&D in substantial amounts. These facts show that changes in the Federal government's R&D support policies strongly influence trends in the labor market and the nature of manpower required for this activity. By extension, "shortages" and "surpluses" are to a considerable extent policy questions, depending on the definition of national need at a given time.

One can discern two stages in Federal funding patterns following the so-called golden years of graduate education in the 1960's. The first was the apparently temporary cutback in total R&D funds to universities and colleges from 1968 to 1970. This period marked a pulling back from the previous era of broad-based support in the basic sciences and a rethinking of policy directions. The second stage, which began in 1971, is marked by increased aggregate R&D funds to universities, as well as a redirection of those funds to problem areas needing quick solution. NSF data indicate that while total Federal R&D funds to universities increased 10 percent from 1972 to 1973, Federal support of projects directed toward the "practical application of knowledge" rose 33 percent compared to only a 2 percent growth in basic research.[5]

Federal policy toward the support of graduate students complements its policy toward research. In the boom era of the 1960's, direct and broad-based Federal support of graduate students rose rapidly.

Federally supported predoctoral fellowships and traineeships alone totaled more than 50,000 in 1968.[6] From that point, however, direct Federal support has fallen off sharply. Only one major fellowship program remains in existence today--the NSF merit fellowship program, with 500 new starts this year. The once substantial NDEA Title IV graduate fellowship program and the traineeship programs of NASA and HUD, have all been terminated. Research assistantships declined 9 percent between 1967 and 1973.[7] The number of part-time NIH training grant trainees has been declining since 1970; full-time trainees also declined in FY 1973.

The major substitute for waning direct Federal support has been self-support, which includes family contributions, savings, earnings of self and spouse, and loans, including those that are Federally financed. Self-support is also often necessary for graduate students who do receive direct Federal support to supplement the inadequate Federal stipend. The combined factors of rapidly increasing tuition, low employment, inflation and recession make it increasingly difficult for students to support themselves during graduate school. Time taken off to work only increases the time required to earn a degree.

While the overall Federal loan amounts to graduate students remain modest ($161 million in the Guaranteed Student Loan program in 1973), this source has become increasingly important as a means of graduate student support, especially in high-cost private institutions.

NSF data indicate a fluctuating trend in self-support. It rose 23 percent as the major source of support for graduate science and engineering students from 1969 to 1972; however, it increased by only 1.5 percent from 1971 to 1972[8] and actually declined by 4.5 percent in 1973.[9] Preliminary figures (unpublished) indicate it began to increase again in 1974.

Another important source of graduate student support, often overlooked, is the G.I. Bill. While accurate data concerning graduate student participation are not available, support for Vietnam era veterans and servicemen, which began in 1967, probably totaled about $300 million in 1974. The importance of this money to students and graduate schools may become more apparent as this wave of students passes from the graduate school scene during the next few years.

The trend, then, has been to remove direct and broad-based Federal support of graduate students and to provide more self-financing opportunities and a limited amount of targeted support instead. The long-term Federal policy issue appears to be whether Federal responsibility should lie primarily in the provision of loan programs as a means of broadening access to graduate education or whether it should also extend to the provision of direct support to foster quality programs and the production of highly trained manpower as well as research.

10

Basic Principles for Federal Support

Some basic principles for Federal support of graduate education are as follows:

1. America's graduate education and research establishment is a national resource. Furthermore, America's capacity to respond to changing societal needs, both culturally and technologically, depends upon the maintenance of the talent pool in intellectual, scientific, and human service areas. America's success in such endeavors as harnessing the atom, space flight, agricultural productivity, and disease prevention has depended upon the existence of a store of fundamental and applied knowledge. Much of this knowledge, as well as the expertise to utilize it fruitfully, is in the centers of excellence in the Nation's graduate schools.

2. The market for highly trained manpower is national. Such manpower is very mobile. Since the benefits of such training are so widely dispersed,[10] neither private nor local nor State sources can or should be expected to assume the entire burden of financing such training.

3. The Federal government itself employs the services of many highly trained personnel. In cases where such employment involves a high percentage of personnel in a particular area, e.g., oceanography, it is cheaper for the government to finance their training at universities than to train them itself or to wait for market forces to supply them.

4. In certain situations, it is in the national interest for the Federal government to stimulate response to changing manpower and knowledge needs; for example, if market response were very slow and if the social cost of such a slow adjustment were high, Federal intervention would be justifiable.[11] Graduate students are demonstrably responsive to changes in labor market demand and to incentives of Federal stipend support[12] within the parameters of broad fields of interest, e.g., biological sciences. The problem, however, is that even with an instantaneous response to new market demands, it still takes an average lead time of approximately 5 years to produce a doctorate recipient. Federal support may help reduce the lag time in two ways: (1) by facilitating entry into the needed fields, and (2) by reducing the time needed to earn a degree.

5. By supplying incentives, the Federal government can encourage students to enter less lucrative careers which are in the national interest. Low lifetime incomes associated with careers requiring extensive advanced training may deter students from choosing such careers and may result in manpower shortages unless Federal subsidies are provided.

6. Federal involvement in areas such as research and development is so dominant that government decisions have a far-reaching impact on both the supply of and demand for knowledge and manpower; hence, Federal policy may be the major force to contend with. The question is not, "whether or not" but rather "how much" and "in what areas" support is necessary. Federal policy should therefore not be viewed as an incidental participant in the supply-demand process, but rather as a determining force in its operation.

7. Knowledge, especially basic knowledge, is part of the public domain. Its wide diffusion and consumption is in the national interest. The search for new knowledge, which is a "public good," discourages normal market investment because the benefits are non-appropriable to individuals (and would be socially harmful if they were, since the widest possible diffusion is the most desirable goal). The high risk and uncertainty involved may result in an insufficient investment for the public's benefit unless there is Federal support.[13]

8. The Federal government can best redress social disadvantages resulting from disparities of race, income, ethnic origin, or sex. It has accepted responsibility for the enforcement of nationwide standards of nondiscrimination to assure equal access in higher education. In addition, the lack of opportunity to attend graduate or professional school

deriving from income or cultural disadvantages is best redressed on the national level. Income barriers artificially prohibit students with equal talents and motivations from receiving advanced education. It is in the national interest to overcome culturally or financially induced constraints on attending graduate and professional schools so that members of a wide variety of groups are represented in the selective areas of academia and the professions.

Toward a Federal Policy for Graduate Education--Recommendations for Action

In view of the above principles, the Federal government has two primary responsibilities with respect to graduate education. First, it has the responsibility to assure availability of sufficient manpower and knowledge resources to meet specific areas of national need. Secondly, it has the responsibility to assure that an optimum pool of qualified talent exists in all areas of knowledge essential to the long-term cultural and practical requirements of the Nation. Furthermore, Federal policy must recognize the necessity of providing a consistent and reliable level of support so that universities will be able to plan and effectively administer their programs.

Federal support, then, should take two forms, both broad-based and specific, depending upon the purpose to be served. For the maintenance of excellence in research and manpower, support for

research and students should be diverse and non-directed and should include some institutional support. Where more immediate national needs must be met, targeted support is clearly called for. In the first instance, merit should be the sole criterion of support consistent with an adequate distribution among fields. In the latter instance, other national priorities such as manpower and support for the disadvantaged may be addressed more explicitly.

A Federal policy of both directed and non-directed graduate student support will maximize flexibility of career choices best suited to individual students' talents and minimize their financial constraints, while also helping to meet national manpower priorities. In line with these responsibilities, the following recommendations are made:

Recommendation 1: The Federal government should provide graduate support for advanced academic study to meet national manpower needs essential to the attainment of agency missions. In addition, such unique Federal programs as the NIH-ADAMHA training grants, which provide more complete teaching, research, student support opportunities, should be expanded and encouraged.

Recommendation 2: The Federal government should provide full financial support for a limited number of highly talented students, selected in national competition, in all academic fields and recognized professions. These

awards would be similar to current NSF portable merit fellowships, only broadened to include the humanities and professions. Such awards should be complemented by a cost of education allowance to the institution a fellow attends.

Recommendation 3: The Federal government must maintain consistency and stability in levels of support for graduate education. Abrupt changes, both start-up and phase-down, at affected institutions are wasteful and inefficient and can disrupt the academic environment and jeopardize the viability of programs for meeting national manpower needs.

Recommendation 4: The Federal government should evaluate the advantages and disadvantages of national service pay-back conditions in return for fellowship or traineeship support. Little is known about effects of pay-back provisions in meeting manpower needs or providing access to graduate level education and training; a study is needed before meaningful recommendations can be made. The study should include consideration of fellowships that would follow a period of national service.

Recommendation 5: The Federal government should strengthen its capability for anticipating emerging manpower needs

and should provide grants to strengthen and improve the quality of graduate and professional programs designed to meet such needs.

Recommendation 6: The Federal government should maintain a balance in its research and scholarship expenditures between targeted, high payoff research and development and less directed pursuits of fundamental scientific and intellectual knowledge. It is important that the Federal interest in graduate education and research recognize the indirect, long-term and often unpredictable benefits that these activities provide the Nation at the same time that they also help fulfill more immediate program functions.

Recommendation 7: The Federal government should initiate and implement a variety of measures, in addition to those mentioned above, specifically designed (1) to prepare disadvantaged racial and ethnic minority students for graduate study in all academic and professional fields and (2) to support the postbaccalaureate training of highly qualified disadvantaged racial and ethnic minority students.

Footnotes

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